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# T R O P I C A L  H O U S I N G  &  P L A N N I N G

# M O N T H L Y  B U L L E T I N

for Dr. C. A. DOXIADES*

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Further information on any of the digests may be obtained on request by reference to the Bulletin no. and the item no. --i.e., 2.3 would refer to New Zealand. Minister of Housing. Housing, 1955. Wellington, Government Printer, 1955. 38p., plans, tables, chart.

* This report has been compiled for private circulation only by Prof. J. Tyrwhitt, 77 Trowbridge Street, Cambridge, Mass., USA.

1. Bauer, Catherine. Economic development and urban living conditions: an argument for regional planning to guide community growth. (Rough draft, May 1955, prepared for the Housing and Town and Country Planning Section of the United Nations, Circulated for comment and discussion, not to be quoted as a UN document.) Berkeley, Calif., The author, 1955. 136p. typed.

In her introduction Miss Bauer sums up conditions in the rapidly growing cities in the developing countries. The pull to these cities is exerted not only by their industrialization but is more often occasioned by the fact that the rural villages no longer can give the people a livelihood, and although their earnings in the city are greater than in these rural villages they are not enough to buy a better standard of living. This wave of expansion is just beginning. The implications are that the insanitary conditions now in the fast growing cities will increase proportionately.

Unfortunately the "aided self-help" housing so successfully tried in rural areas is seldom effective in congested metropolitan areas.

The proposal to cure the big city congestion by a policy of decentralization of industry and the building of new or satellite cities has not yet proved effective. There has been no great push to the new experimental satellites, and the great cities continue to grow.

Miss Bauer feels that a closer union of minds between economists, sociologists, government policy makers, and civic reformers might succeed in framing a solution. Her paper is a plea for such a regional view of both economic and urban development in order to achieve better living conditions along with economic progress.

At the end of her introductory pages the author states, "In the body of the paper...a wide range of references has been assembled to illustrate certain trends, problems, and possibilities. Much of this material seems to suggest, furthermore, that small cities, low density and a dispersed pattern of urbanization may have certain definite advantages over large metropolitan centers, from many viewpoints. But these are highly tentative deductions, to be tested and debated in the light of concrete facts and specific local conditions. Indeed, this whole paper is merely a rough indication of the kind of far more rigorous analysis that is needed. If it serves to suggest that alternative patterns of economic development and urbanization are possible, and that different patterns can have quite different social effects, it will have fulfilled its purpose."

These references are copiously annotated and accompanied by connective expository text in essay form. Miss Bauer indicates that these quotes and comments "should be viewed as an effort to outline a sequence of facts and hypotheses, along with miscellaneous evidence, in order to raise certain questions about the development process which I am quite unqualified to answer in definitive terms."

Although the material in these extensive quotations and comments does not lend itself to summarization, the headings under which it is arranged will serve to give an indication of its coverage. They are:

Introduction. The problems of rapid urbanization.

1. The paradox of progress.
2. Must urban growth mean mounting squalor and disorganization?
3. The challenge of fatalism: new views and efforts.
4. Is "decentralization" the answer?
5. Dispersed industrial development: con and pro.
6. The effect of urban structure on living conditions and social progress.
7. Can the pattern or urban and industrial growth be planned?

The following is a quotation from the summing up at the end of Part 7:

"If the propositions put forward in this paper are correct, regional planning to guide the future pattern of urban and industrial growth has great potential significance for material welfare. As a

resource-saving device it is a means of translating meager economic gains into better living conditions, and it can at the same time broaden the national distribution of such gains. But although these goals are very important in themselves, fundamental questions of social dynamics are also involved.

The basis for the community development and "aided self-help" movement which has been taking hold in rural areas around the world is primarily the need to stimulate individual and group initiative, productive adjustment to new value systems, and responsible participation in the development process. While at the urban level the fact that this vital transformation seems on the whole more readily attainable in small urban communities than in large congested cities, is one of the basic arguments for a decentralization policy. And finally at a still broader scale, regional planning might perform a similar function. In the view of the Tennessee Valley Authority, this was in fact its primary role:

"Those who expected the TVA to produce a 'blueprint' of the Valley's future or to establish a series of master plans have been disappointed. TVA long ago firmly rejected that type of regional planning and the rejection was not based entirely or even primarily upon lack of power. Another concept of regional planning was considered more useful, more in accord with the democratic tradition and more in keeping with the needs of a region the planning of whose future 'must be the democratic labor of many agencies and individuals and final success as much a matter of general initiative as of general consent.' Those who have seen democratic planning as the broader process of increasing the scope of regional decisions and the opportunities presented to the people for their action have better understood the planning functions and performance of TVA. It is, moreover, this concept of planning for the development of the resources of a region that has challenged world attention. TVA, in line with an expression of John Dewey, has helped to produce, not a <u>planned region</u>, but a <u>planning region</u>. . . The efficiency of central planning has been combined with the active participation of the people of the region."

- Menhinick and Durisch, "Tennessee Valley Authority," Ibid, p.144.

But if local leaders and citizens are to take part in formulating a regional development program and carrying it out, they first

have to understand the area's needs and possibilities in their own terms. Research is therefore needed not only to support high-level expert judgments, put also to test policy decisions in local terms, and finally, as a direct means of public education. The local Planning Research and Action Institutes, recently inaugurated in the Uttar Pradesh in India on the advice of Albert Mayer, exemplify such a viewpoint and purpose.

This concept, recently popularized in the "community self-survey", was the key to Patrick Geddes' whole philosophy of regional planning, greatly influenced by his own long Indian experience. It has been eloquently reinterpreted by his most eminent disciple:

> "The task of regional survey, then, is to educate citizens: to give them the tools of action, to make ready a background for action, and to suggest socially significant tasks to serve as goals for action. Ultimately, this becomes the essential duty of every vital school, every responsible university. In this concrete sense - and not in any vague hope - education is the alternative to irrational and arbitrary compulsion. . . Without such a broader cultural foundation, regional planning can have but a minor political significance. Once the cultural base is achieved, however, regional planning becomes one of the essential attributes of a progressive civilization; and every effective economy it introduces tends to further the capacity for association and to widen the field of significant action."
> - Lewis Mumford, THE CULTURE OF CITIES, New York 1938, p. 387.

2. Dunham, Daniel C. Solar energy considerations in city planning. Cambridge, Mass., Paper prepared in Harvard University, School of Design, Architecture 1-1a Course, 1955. 12p. typed.

The following quotation is from pages 8-9 of the paper.

The use of planted wind breaks has been used often for individual areas but its use in town planning up until now has been limited. Architect Victor G. Olgyay, designing a wind-protected suburban development in New Jersey, claims that by using climatology, meterology and architectural engineering on a city of this size an effect is produced equivalent to increasing indoor winter temperature as much as sixteen degrees while lowering the

summer temperature as much as eighteen degrees. This temperature variation if expressed geographically would have the same effect as moving the entire community to upper New York State in the summer and to Virginia in the winter.[1] Through correct solar and climatic orientation it would be possible for a planner to decrease a community's drain on fuel reserves without lowering its standards, or to increase liveability without a subsequent increase in fuel requirements.

In tropical regions where a far greater intensity of radiation is received, potentials of solar energy as a fuel are greatly increased. In higher latitudes, it must be considered as a suppliment to existing fuels, at low latitudes the effective use of solar energy and conversion might be considered paramount to the discovery of a new national resource. Historically its use has hardly been more intensive than in colder climates, restricted mainly to agriculture or to evaporation and separation of sea water and salt. It is now a subject of extreme importance to fuel-poor countries.

The heating of houses, if such were desired, could be easily accomplished; solar cooling is a definite possibility. Contemporary architecture in this area has provided ingenious and effective sun protection devices, but there has been little interest displayed --except in this country--towards mechanical cooling through solar energy.

Traditional Arab houses in the Mediterranean region display use of a secondary radiation principle, that of back radiation to the night sky. They are similar in principle if not in scale to apparatus used to test minimum temperatures that can be obtained by this phenomonen. Its form is essentially a windowless box open at the top to the sky. The back radiation of the central courtyard surface drops temperatures several degrees at night. The structure of the house itself acts as a well of cold air throughout much of the day. The interior temperature remains well below the ouside temperature. ~~Also the funnelling of air currents to ground floor and passing them over running water~~. To my knowledge this has no counterpart in modern architecture of the area.

Some work has been done in mechanical cooling by George Lof of the University of Denver. He developed an experimental design of an air conditioning system gased on dehumidification using solar

[1]Olygay, Victor G., "The Temperate House," Architectural Forum, March 1951, p. 193.

fuel which he believes would be only slightly higher in cost than the conventional system.[1]

3. Eyheralde Frías, René. Developmental design in housing. Translated by César Garcés. Bogotá, Inter-American Housing Center, 1955. 94p. photos., sketches. (Technical series no. 1.)

This is a detailed description of a method of housing development as worked out at the Inter-American Housing Center, under Howard T. Fisher of Chicago, who came to Bogotá in 1952 for the purpose of helping the staff set up a laboratory program. This research was sponsored by the Technical Assistance Administration of the United Nations, in response to a request made by the Colombia National Housing Agency.

"Developmental design" as the term is used here is, in essence, "progressive construction technique" and proceeds from the determination of small structural elements. An organizational diagram of procedures under this program indicates that the difference between it and the process usually followed lies in the 3-dimensional as against the 2-dimensional development. It is a system calling for intensive research before the building of housing.

The following diagram indicates the steps of the "Developmental Design" process:

| | |
|---|---|
| KNOWLEDGE OF THE PROBLEM | . Programming<br>. Research |
| ANALYTICAL DEVELOPMENT IN THREE DIMENSIONS | . Preliminary sketches<br>. Construction sequence drawings<br>. Mock-ups |
| SYNTHESIS | . Comprehensive mock-up<br>. Working drawings |
| TESTING | . Test of structural elements<br>. Construction of portion of complete structure<br>. Construction of complete housing unit |

[1]Daniels, Farrington, and John A. Duffie, ed., Solar Energy Research, The University of Wisconsin Press, Madison, 1955, pp. 43-45.

In essence the system works out a construction sequence from standard hollow block, lintel, door frame, gutter, etc., without too much concern with their relationship to the entire complex. Correlation is accomplished later. Comprehensive mock-ups are made.

In some of the proposed solutions materials are used which are not now available on the market. Then ways of producing them are studied.

The final step in the process is the building of a test house which may serve as a prototype for mass production. This house is subjected to all the tests normally required by local building codes, etc. It is evaluated not only in terms of structural logic but in terms of ease and economy of production and erection.

HOT DRY AREAS

4. Afrique du Nord. L'Architecture d'aujourd'hui, June 1955, vol. 26:60, whole no.

Climate: 115° - 28°

Rainfall: circa 25"

This issue of L'Architecture d'aujourd'hui is concerned primarily with housing in Algeria, Morocco, and Tunisia, and secondarily with schools, public health, and public buildings in the same areas. These three countries pose problems often analogous but sometimes totally different. The editors acknowledge their indebtedness to the Moroccan group of C.I.A.M.

Much of the material is concerned with large apartment type developments of a European character. These we are not concerned with.

In the Algerian section there are an air view and a surface photograph of a Musulman development. They show rows of concrete houses connected by walls. The section on the reconstruction of Orleansville included photos. and plans of 3 types of housing. See photostat herewith.

The traditional Musulman housing is of a one-story patio type, and this is one of the solutions used in the reconstruction in Morocco. It resembles that shown on in the section on Algerian housing. Herewith are photostats showing examples of the layout of this Moroccan housing.

The section on Tunisia is concerned chiefly with the urban apartment type of building, and with public building. Attached, however, is an illustration of a semi-rural house.

A section is included on the traditional

methods of living of the Arabs in the different geographical areas near Rabat: see attached photostat.

Top left: sketch and plan of a tent housing 2 men, 4 women and 2 children, who own 11 cattle, 1 mule, 1 horse and 1 donkey. There is a well 800 m. away.
Top right: dwelling type of the Mestara tribe at Zoumi in the Rif. It houses 4 families with 11 children, who own 1 mule, 3 cows, 3 calves, 33 goats, 61 olive trees, 30 fig trees and 25 orange trees. The well is 500 m. away.
Near Bottom: Photo and plan of a type at Mechtas.
At bottom of page: Diagram showing natural evolution of the type at Rharb.

5. From shifting sands to firm foundations through cooperative aid: Arab refugees make new homes and become self-supporting. (In United Nations bulletin, May 1, 1954, vol. 16:9, p. 354-357; with photos.)

Climate: 108° - 25° F

Rainfall: 25"

This article is descriptive of the Beit Qad Village in Jordan, made up of Arab refugees who had been under care of United Nations Relief and Works Agency for Palestine Refugees (UNRWA). The UN will continue to advise farmers in this first agricultural cooperative set up under UNRWA, but material aid will end when school and community hall is turned over to the community.

Each family was given 25 acres of land and farm implements and fertilizers and seed. They were also given a 2-room house with stable and cisterns for conserving water. The Arabs worked the land, living in tents, before houses were ready.

This article cites Beit Qad as a successful agricultural cooperative. It does not describe the houses in any detail.

Included in article is a photograph of housing at Marj Naja, a model village fifty miles north of Jericho to house 36 families; and here different methods of construction were tried during the building, including the Upper-Egypt type of dome and vault roofing which avoids the use of timber. See photostat illustration of this development.

6. Cole, J. P. Some town planning planning problems of Greater Lima. (In Town planning review, Jan. 1956, vol. 26:4, p. 242-251; with photos., maps, plan.)

Population: 926,400
Climate: 90° - 40° F
Rainfall: 1"

Housing and building materials are discussed on pages 246-248. As in most large South American cities overcrowding is the most serious housing problem. In Lima the slum area is made up of callejons, which are narrow passageways about 50 or 60 yards long and only 2 or 3 yards wide with row houses which have no open space behind. These are usually adobe houses with one or two rooms per family.

Water supply is often from a communal tap, and drainage conditions are poor. It is estimated that from 40 to 50% of the population live in these and comparable dwellings.

Because the new housing is so expensive and because of the demolition of some of the slums, many thousands of working class people have spread out to non-agricultural land--to the sharp hills, to the cobbles of a river bed and to the deserts--and here built shack-type housing for themselves on which they pay no rent. There are more than 40 of these so-called "clandestine suburbs." Dwellers in these suburbs join together and provide as many services as possible. Nevertheless, they are without sewerage, electricity, schools, and surfaced streets. The first homes built by these squatters are usually of cane matting tacked to wooden posts; or wooden huts made of boxes and crates. Later they usually construct more permanent houses of adobe (usually made on the site), brick, stone, or concrete.

A study made in 1955 calculates the population of these "clandestine suburbs" as over 100,000, or about 10% of the population of Greater Lima.

Although very light rainfall (average 1 inch) and mild climate allow the lightest type of construction no cheap house within reach of the poorer classes has yet been designed. The workers' incomes are so low that they barely cover food and other basic necessities, leaving little or nothing for rents.

The traditional building material here is adobe for the ground floor, cane and mud for the first floor, and cane matting for light construction work. They are all cheap materials. Toward the end of the last century bricks were produced locally and are now used extensively in the capital. In the 1920's cement began to be produced in Lima and is now used in considerable quantities. At present both iron and wood for all types of construction must be imported. Steel girders because of their cost are seldom used and most of the modern, multi-storied buildings in Lima have ferro-concrete frames with brick walls.

It is hoped that within two years Peru will produce iron and steel and in that way reduce cost of ferro-concrete construction. Extensive use is now being made of glass and asbestos cement, both locally produced.

HOT HUMID AREAS

7. Rivera Santos, Luis, and others. Manual para la organizacion de proyectos piloto de ayuda propia y ayuda mutua en vivienda. Bogota, Centro Interamericano de Vivienda. Servicio de Intercambio Cientifico, 1953. 108p., photos., maps, plans, diagrams. (Manuales y cartillas no. 2.)

Climate: 94° - 62° F
Rainfall: 61"

The work is part of the "Programa de Cooperacion Tecnica de la Organizacion de Los Estados Americanos Consejo Interamericano Economico y Social Union Panamericana." As its title states it is a study of self-help or mutual-help housing in Puerto Rico. The text and illustrations describe the technical procedure and the appendix contains data of size and cost of materials.

8. Steel forms speed San Juan housing. (In Architectural record, Jan. 1956, vol. 119:1, p. 203-204; with photos.)

Population: 224,767
Climate: 94° - 62° F
Rainfall: 61"

1583 concrete houses are being "poured" by means of a unique system of steel forms, at the Villas Las Lomas low-cost development in San Juan, Puerto Rico. It is a sloping tract of 250 acres.

The steel forms were designed by Wallace K. Harrison of Harrison & Abramovitz and a director of the International Basic Economy Corporation, and engineered by Emil H. Praeger, structural engineer. Each form consists of heavy ribbed plates, prefabricated into one complete house form, including cavities not only for exterior walls but also for interior walls.

The 321/2-ton form is hoisted in its entirety, by means of a mammoth mobile crane, and lowered onto the already-poured 4-in.-thick reinforced concrete slabs on grade. All piping and electrical conduit are incorporated in the slab, and vertical risers fit readily into the proper walls in the form. Steel reinforcing rods are also secured before lowering of the form. Small concrete blocks, barely visible in the photo on the following page, are tied to the rods at intervals to keep them from slanting against the sides of the forms during the pour.

After the form has been set securely on the concrete slab, the exterior steel panels, which are loose during the lowering so that there will be a wider opening into which the reinforcing rods can fit, are locked to the interior faces by means of

tie rods. Concrete is then poured into the wall cavities, as shown. The steel "lips" at the tops of the exterior panels can be moved in order to guide the concrete into the forms. Exterior walls are poured to a thickness of 5 in., interior walls 2 or 3 in.

The next day, after the concrete has set for a little less than 24 hours, the form is loosened and lifted off the house, then set down again on another slab to form another house. About 28 days later, or less, after the concrete has hardened sufficiently, a concrete roof slab is laid on top of it. The 4-in.-thick roof slabs are poured in piles of six, one on top of another, much as they are for lift-slab operation. A thin layer of paraffin oil separates each slab. Each day six houses are "roofed" by "sucking" each of the slabs up separately by means of a vacuum suction apparatus on a crane and lowering it onto the proper house. Metal roof anchors and wall anchors at eight points are welded together to supplement the 21-ton weight of the slab in keeping the roof securely in place.

Only six forms are used in Villa Las Lomas, which makes possible the pouring of just six houses a day. Activities on the site are planned so that some progress is made on each group of six houses every day, from leveling of the plot to painting.

Of the six forms used, there are two basic designs, each of which is planned for easy expansion. Three variations in each of the two basics, simply minor changes in the facades, relieve what might otherwise be a "too standardized" appearance. The floor plan of one of the houses, the Trade Winds, It is 23 ft 10 in. wide and 29 ft 5 in deep (not including the roof over-hang), and includes three bedrooms, living room,kitchen and bath, in addition to front and back porches. The bath has a stall shower, but the floor curb is raised so that it can be filled with a few inches of water to provide a small tub for bathing babies. A Trade Winds house, completed and occupied, is pictured on the preceding page.

The second basic house, the Belair, measures 20 ft 9 in. wide by 33 ft 1 in. deep, with an area of 685 sq ft as opposed to an area of 705 sq ft for the first type. All six houses sell for $6000 to $6200, the $200 difference being site preference. Architect for the houses was Edward L. Barnes of New York.

The houses have no heating system, since the temperature in Puerto Rico is almost never low enough to require heat. Window openings are not enclosed with glass, but with adjustable aluminum louvers, which can be closed when necessary for keeping out weather or light. Natural ventilation is provided through door and window openings and wall slots under the roof overhang, which are left in the concrete forming. Both the interior and exterior walls and ceiling are painted. No other finish is practical in such a moist climate. All floors are natural cement tile.

So far well over 1000 houses have been started, and almost half are completed and occupied. Before Villa Las Lomas is completed this year, it will be serviced by a 10-acre shopping center, with a huge supermarket and the first Woolworth's on the island, and an elementary school, church and park areas.

The $11,000,000 development, one of several in the San Juan area, is jointly financed by the Ibec Housing Corp., of which Winthrop Rockefeller is chairman, and the Corbetta Construction Co., both of New York City. Henry C. Rexach, San Juan general contractor, is in charge of construction operations, which also include such related activities as grading and pouring concrete streets, erecting electric service poles, laying water mains and sewer pipes.

See photostat of illustrations illustrative of process.

9. Zobel, Jaime. A post war house development in the Philippines. Cambridge, Mass., Paper prepared in Harvard University, Architectural Sciences 110 Course, 1955. 7p. typed. photos., folded plan.

Population: 983, 906

Climate: 101° - 58° F

Rainfall: 80"

This is a student's paper, presented in a course in Harvard University's Dept. of City Planning and Landscape Architecture, and is descriptive of an after-war development on the outskirts of Manila. He points out that traditionally suburban living has not been popular in Manila; the outlying areas housing only the lowest-income class. However, after the war the city became overcrowded due to an influx from the other islands, and it was then that the Ayala Securities Corporation (founded 120 years ago) decided to develop for residences a large tract they owned in the munici-

pality of Hacienda San Pedro Makati. This tract is 15 minutes by motor from the heart of Manila.

The plan for the development embraces three types of residential zones: high-income, moderate-income, and low-income zone, with all the services and utilities of the central city provided. The taxes on this complete suburb would be lower than on a central city development since in the Philippines property taxes in "cities"are at the rate of 1% while in the so-called "Municipalities"they vary from a rate of 7/8 of 1% up to 1%.

The developers knowing that suburban living was not popular with the city dwellers, decided to build first the residential section for the high-income group, called Forbes Park, and as a forerunner to this construction they persuaded the Manila Golf Club and the Manila Polo Club to locate their new club houses here. The old club centers had been destroyed in the war. They also felt that this group would be helpful in their later efforts to attract industry to the industrial zone.

The developers realized that once this Forbes Park development materialized the less costly areas would be in demand.

Rather rigid controls have been established, such as the requirement that building must be started on the lots within a certain time and that the buildings must be approved by an architectural control board, etc. There was some opposition to these restrictions, but they are enforced. There was also a demand by the residents for city services, such as police, and this protection is now afforded to the residents.

The middle-income development called San Lorenzo Village has also been completed. The restrictions here are almost the same as for the higher-income section.

The industrial area is still far from completion. A few plants have been built.

In both there are park areas and the vegetation and trees are growing and "peace and beauty is taking its shape again in the Philippines."

The whole point of the article is that a determined effort to build a whole new section of the city, including industry and low cost houses, was set in motion by first attracting the well-to-do. These provided the prestige necessary to entice further development, and also paid good taxes from the start. The success of the venture has encouraged other similar developments.

## III SPECIAL ARTICLE

10. Bell, K.G. Tropical air conditioning: modern methods surveyed. (In Electrical review, Sept. 2, 1955, vol. 157:10, p. 467-468.)